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AUTHOR	Pugh, William M.; And Others
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ABSTRACT

The amount of life stress, as measured by the Schedule of Recent Experience (SRE), has been shown to be related to the onset of illness. This instrument was originally developed with a civilian population, and it became apparent that some questions were inappropriate when it was to be applied to a military population. Furthermore, it was believed that identifying significant dimensions of life stress might provide an indication of how the questionnaire could be revised to gain better results with military personnel. A cluster analysis was performed on the SRE responses made by members of the crews from three Navy cruisers. Four clusters of life events were generated. The item content was described as follows: (1) Personal and Social changes, (2) changes related to Work, (3) Marital changes, and (4) changes related to Disciplinary actions. When the responses to the SRE, given by men aboard an aircraft carrier and a battleship were clustered, esentially the same four clusters evolved for both rated (petty officers) and unrated men. The only notable exception was the lack of a Disciplinary cluster for the rated men. The results showed that the clusters of SRE items were highly stable over very different Navy populations. Thus, they can serve as a guide in determining which items may be utilized or deleted from the questionnaire. Also, it is believed that development of these clusters may lead to an improved method of scoring the SRE items. (Author)

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William M. Pugh, Jeanne M. Erickson,

and

Richard H. Rahe, MC, USNR

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Significant changes in a subject's life pattern has been shown to be related to subsequent illness.[1,2] The Schedule of Recent Experience (SRE), is a questionnaire devised to document changes in personal, social, family, and occupational situations. The SRE was originally used in civilian populations but was modified for administration to military populations.[3]

So far two methods of scoring the SRE have been used. One method was to assign psychophysical weights to each item. These weights were derived by having a group of raters evaluate each life event for the amount of personal adjustment it was felt to require. The other method of scoring was to apply weights computed by a step-wise multiple regression analysis. While both of these methods predict illness to a moderate degree,[2,4,5] it is believed that improved prediction of illness can be effected with the SRE.

The present paper includes two studies in which the SRE items were clustered. The first study investigated a group of Navy enlisted men aboard three cruisers and the second examined rated and nonrated Navy men aboard an aircraft carrier and a battleship.

The purpose of these studies was to group the SRE items into several highly intercorrelated clusters, and to determine if there were any differences in the clusters manifested by the rated versus the nonrated men.

Method

Subjects. The subjects for the first study were 2,678 Navy enlisted men who were aboard three U.S. Navy cruisers. Mean ages for the three cruiser samples were 22.4, 22.2, and 24.4 years.

The subjects in the second study consisted of 2,025 Navy enlisted men assigned to an attack aircraft carrier and a battleship. This sample was composed of 986 rated men and 1,039 nonrated men. Mean ages for the carrier and battleship samples were 22.4 and 23.3 years, respectively.

Procedure. The SRE questionnaire consisted of 42 life events and subjects indicated which ones they had experienced and how often each event occurred. A list of these items and their psychophysical weights are given, in abridged form, in Table 1. Each item is divided into five, six-month intervals, but in the present studies only the three most recent were examined. That is, the responses investigated were to events occurring 18 months prior to the test administration. Each life change that a subject indicated had occurred during this 18-month period was scored "1," otherwise it was scored "0."

After every subject was scored, these data were clustered for each sample from each ship. Thus, clusters were produced for each of the cruiser samples, and for both rated and nonrated men aboard the aircraft carrier and battleship.

The method used to cluster the items was an Iterative Intercolumnar Correlational Analysis developed by McQuitty and Clark.[6] This analysis yields clusters of items which have high positive intercorrelations but low or negative correlations with items of other clusters.

Results

In the first study, four clusters were produced which were stable across the three cruisers. The largest and most highly intercorrelated of these included items which dealt with subject's personal and social life. The second cluster was composed of items relating to changes in type of work and working conditions. The third cluster was concerned with changes associated with marriage, and the fourth cluster contained items which dealt with the subject's incurrence of disciplinary action.

In the second study four clusters with essentially the same content as the four above were produced by clustering the responses to the SRE by the nonrated samples. These clusters were also labeled: 1) Personal and Social, 2) Work, 3) Marital, and 4) Disciplinary. However, when the items were clustered for the rated samples, only the first three of these clusters were manifested. The Disciplinary cluster was not clearly evident for the rated men.

The items contained in the various clusters are listed in Table 2. There are three columns on the right-hand side which correspond to the three samples studied. "A" is the cruiser sample, "B" is the rated men aboard the aircraft carrier and battleship, and "C" is the nonrated men of the aircraft carrier and battleship. The "X's" following the items indicate which items were included in the various clusters for each sample. The "X" shows the item was included, and the columns indicate for which sample. It can be seen that the clusters generally had the same content for all of the samples.

The mean correlation of the items within a cluster for each sample, and correlation of the items of each cluster with every other cluster is shown in Table 3. It can been seen that the correlation of the items within each

cluster is substantially higher than the correlation of items from one cluster with those of another cluster. The only instance where items from two different clusters were not uniformly low was when the items of the Personal and Social cluster were correlated with the items of the Work cluster.

Since the correlations between the Personal and Social cluster and the Work cluster were moderately high, it appeared that they could be combined into a single cluster. When this was done the items in the resulting cluster appeared to refer to minor changes as opposed to the items in the remaining clusters. And since the SRE weights are reliable judgments of the amount of changes these items require, a "t" test was done between the mean SRE weights of the combined Personal and Social-Work cluster and the combined Marital-Disciplinary cluster. The differences was highly significant for each of the samples: cruiser sample ($t = -10.97$; $df = 22$), nonrated men ($t = -14.13$, $df = 19$), and rated men ($t = -10.38$; $df = 15$).

Further evidence that the SRE items could be divided into two groups - major and minor changes - was produced in the second study. In that investigation small groups of items were found which correlated equally well with Personal and Social changes and Work changes, but poorly with the items of the remaining clusters. These items for the nonrated men were: Items 14, 18, and 41, and their mean correlation with the Personal and Social-Work cluster was .15 and with the items of remaining clusters it was .02. The items for the rated men were: Items 12, 19, and 41, and their mean correlation with Personal and Social-Work cluster was .14 and with the items of the remaining clusters was .07. These items, however, were not correlated among themselves sufficiently high to constitute a unique cluster.

Additional items for the Marital cluster were also found. For nonrated men, Items 13, 17, and 33 had a mean correlation of .15 with items in the Marital cluster, but only .05 with items of the other clusters. Items 13, 24, and 31 were the additional items for the Marital cluster for rated men. These items had a mean correlation of .16 with other Marital items and .04 with items of the remaining clusters.

Discussion

The most striking result was that clusters with essentially the same content were reproduced from sample to sample with the only exception being the lack of a disciplinary cluster for rated men. Thus, for all samples studied three clusters were identified: 1) Personal and Social changes, 2) Work changes, and 3) Marital changes. The lack of a disciplinary cluster for rated men may be explained by their greater maturity, since they are more likely to be older and married than are the nonrated men.

A high correlation between two items means that, if a subject reported one event, he also reported the other. Similarly, item clusters would indicate that individual subjects tended to report one type of change rather than another. This combined with the finding that the clusters can be differentiated by the amount of life change represented by the various life events they contain, suggests that subjects who report major life changes are not so conscious of smaller changes.

Now that stable clusters have been identified new possibilities are open for improving prediction of illness with the SRE. For one, the clusters could be scored instead of scoring individual items, thus retaining some of the redundancy of the items which is lost in regression weighting. It is

desirable to keep redundant items in the case of the SRE because the frequency of response to many of the items was low. Scoring the clusters may also improve the psychophysical weighting system. A recent examination of the reliability of the four clusters discussed has shown that the Personal and Social cluster contributes more to the total SRE score than any other cluster, while the Disciplinary cluster contributes the least. However, it was found that the Personal and Social cluster had the lowest test-retest reliability, while the Disciplinary cluster was the most reliable. Considering the direct relationship between reliability and validity, it would seem that the contribution of these clusters should be adjusted so that the Disciplinary cluster would contribute more than it does at present. This might entail revising the SRE by adding items in some areas and deleting items in other areas.

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Table 1

Abridged Schedule of Recent Experience

	Item	Weight
1.	More or less trouble with superiors	23
2.	Marked changes in sleeping pattern	16
3.	Marked changes in eating habits	15
4.	Substantial changes in personal habits	24
5.	Substantial changes in amount or type of recreation	19
6.	Substantial changes in social activities	18
7.	Substantial changes in church activity	19
8.	Substantial changes in family get-togethers	15
9.	More or less financial problems	38
10.	More or less in-law trouble	29
11.	More or less arguments with wife	35
12.	Substantial personal successes or awards for achievement	28
13.	Loss of wife by death	100
14.	Major illness, injury or substantial health change	53
15.	Death of close family member	63
16.	Death of close friend	37
17.	Gained new family member	39
18.	Major change in health or behavior of family member	44
19.	Changed place of residence	20
20.	Held in civilian jail or brig	63
21.	Guilty of minor infractions of civilian law	11
22.	Married	50
23.	Divorced	73
24.	Marital troubles	65
25.	Association with wife interrupted by orders	45
26.	Offspring married or moved out	29
27.	Changed working conditions or hours	20
28.	Change in work responsibilities	29
29.	Received court-martial	47
30.	Changed living conditions	25
31.	Wife started or stopped work	26
32.	Mortgage or loan greater than $10,000	31
33.	Mortgage or loan less than $10,000	17
34.	Foreclosure on mortgage or loan	30
35.	Leave or vacation before enlistment	13
36.	Changed high school or college	20
37.	Changed to new type of work	36
38.	Began or ceased high school of college	26
39.	Disciplinary Captain's Mast	30
40.	Change in parents situation	40
41.	Change in dating habits	40
42.	Not given promotion	20

Table 2

SRE Items Included in Each Cluster for Each Sample

Minor Changes

		Sample*			
		A	B	C	Weight
	Personal and Social Changes				
1.	More or less trouble with superiors	X	X	X	23
2.	Marked changes in sleeping pattern	X	X	X	16
3.	Marked changes in eating habits	X	X	X	15
4.	Substantial changes in personal habits	X	X	X	24
5.	Substantial changes in the amount of type of recreation	X	X	X	19
6.	Substantial changes in social activities	X	X	X	18
7.	Substantial changes in church activity	X	X	X	19
8.	Substantial changes in family get-togethers	X	X	X	15
9.	More or less financial problems	X	X	X	38
	Work Changes				
27.	Changed working conditions or hours	X	X	X	20
28.	Change in work responsibilities	X	X	X	29
30.	Changed living conditions	X	X	X	25
37.	Changed to new type of work	X	X		36

Major Changes

	Marital Changes				
10.	More or less in-low trouble	X	X	X	29
11.	More or less arguments with wife	X		X	35
19.	Changed place of residence	X			20
22.	Married	X	X	X	50
24.	Marital trouble	X	X		65
25.	Association with wife interrupted by orders	X	X	X	45
31.	Wife started or stopped work	X	X		26
33.	Mortgage or loan less than $10,000	X			17
34.	Foreclosure on mortgage or loan			X	30
	Disciplinary Changes				
20.	Held in civilian jail or military brig	X	X		63
29.	Received court-martial	X	X		47
39.	Disciplinary Captain's Mast	X	X		30

*A = Enlisted men aboard cruisers
B = Nonrated men aboard aircraft carrier and battleship
C = Rated men aboard aircraft carrier and battleship

Table 3

Mean Correlation of SRE Items from Each Cluster with Every Other Cluster

	Cluster			
Sample*	Personal and Social	Work	Marital	Disciplinary
A	.33			
B	.42			
C	.36			
A	.13	.20		
B	.19	.33		
C	.17	.30		
A	.06	.04	.22	
B	.06	.04	.34	
C	.10	.06	.25	
A	.02	.02	.00	.22
B	.00	.03	.04	.29
C	-	-	-	-

*A = Enlisted men aboard cruisers (N = 2,678)
B = Nonrated men aboard aircraft carrier and battleship (N = 1,039)
C = Rated men aboard aircraft carrier and battleship (N = 986)